FP NUMERIC

Group of 4 Students of 5th sem BTech(CE) got SGP project from one of the hotel in Valteva. They have mentioned following requirements.

       A hotel has a certain number of rooms. Each room can be either single bed or double bed type and may be AC or non-AC type. The rooms have different rates depending on whether they are of single or double, AC or Non-AC types. The room tariff however may vary during different parts of the year depending up on the occupancy rate. For this the computer should be able to display the average occupancy rate for a given month, so that the manager can revise the room tariff for the next month either upwards or downwards by a certain percentage. Perform structured analysis and structured design for this Hotel Automation Software that would automate the book keeping activities of a 5-star hotel.

    Guests can reserve rooms in advance or can reserve rooms on the spot depending upon availability of rooms. The receptionist would enter data pertaining to guests such as their arrival time, advance paid, approximate duration of stay, and the type of the room required. Depending on this data and subject to the availability of a suitable room, the computer would allot a room number to the guest and assign a unique token number to each guest. If the guest cannot be accommodated, the computer generates an apology message. The hotel catering services manager would input the quantity and type of food items as and when consumed by the guest, the token number of the guest, and the corresponding date and time. When a customer prepares to check-out, the hotel automation software should generate the entire bill for the customer and also print the balance amount payable by him. During check-out, guests can opt to register themselves for a frequent guest's program. Frequent guests should be issued an identity number which helps them to get special discounts on their bills.

Assuming that in-house developers (student's stipend) is Rs. 6000 per student per month. Apply your knowledge of FP and COCOMO to calculate final cost of this software development.

Assume that Software is developed by Using JAVA, 1 FP is equal to 30 lines of JAVA code.

Solution:

EXTERNAL INPUTS	There are three types of users of given software Guest, Receipt, Manager
	Log in Page * 3 (for Guest, Receipt, Manager)
	Dashboard
	Reserve Room (Guest)
	Allot Room (Recipient) (detailed form including approximate stay time)
	Add Food (Food Manager)
	Manage menu (Food Manager)
	Place Order (Guest)
	Manage Rooms (Manager)
	Add User (For manager , add new receipt)
	Bill Generate & Checkout
	Room Traffic management
	Register (for guest)
	Manage rooms (manager)
	Add User
	Guest program management Add guest Remove Guest Manage coupons
	Total Inputs 20

Outputs	Login Confirmation (guest , manager, receptionist)
	Register Confirmation (guest)
	Room Traffic Prediction (manager)
	Room allotment confirmation (guest, receptionist)
	Food order history (guest, manager)
	Frequent Guest Program- confirmation
	Add menu confirmation
	Place order confirmation
	Bill generation success
	Editing of rooms, Guest, Menu.
	Output= 18
Inquiries	Type of Room confirmation
	Room Allotment acknowledgment
	Check out
	Bill generation Confirmation
	Average Occupancy & Traffic prediction
	Guest confirmation
	Add user confirmation
	Inquiries = 7
Files	Inward Files & documents
	Outward Files & documents
	Room allocation files

	List of menu, food
	Order history room wise
	Manager & staff list
	Types of Room
	<mark>Files=7</mark>
External Interface	User to database
	Application to database
	Prediction from past data
	Past data to interface
	Application to predictio
	<mark>External Interface=5</mark>

FP table

Inputs = 20
Output=18
Inquiries=7
Files=7
External Interface=5

Now calculate FP point using equations than convert FP to LOC and Calculate COCOMO.

14 Question:

1. Does the system require reliable backup and recovery?
2. Are data communications required?
3. Are there distributed processing functions?
4. Is performance critical?
5. Will the system run in an existing, heavily utilized operational environment?
6. Does the system require on-line data entry?

7. Does the on-line data entry require the input transaction to be built over multiple screens or operations?
8. Are the master files updated on-line?
9. Are the inputs, outputs, files or inquiries complex?
10. Is the internal processing complex?
11. Is the code to be designed reusable?
12. Are conversion and installation included in the design?
13. Is the system designed for multiple installations in different organizations?
14. Is the application designed to facilitate change and ease of use by the user?

Step 1: FP = 14 * 3

Instead of taking 3 as average value, on bove 14 question select ans in range of 1 to 5
1. Ex: Does the system require reliable backup and recovery? = 3
2. Are data communications required? =2

So on do such selection for all 14 and sum of all 3 + 2 + …..

- **Step-2:** Calculate Complexity Adjustment Factor (CAF).

  $$CAF = 0.65 + (0.01 * F)$$

Step 3:
- FP=4 #inputs + 5 #Outputs + 4 #inquiries + 10 #files + 10 #interfaces

- **Step-4:** Calculate Function Point.

  $$FP = UFP * CAF$$

Next convert FP to LOC

LOC to KLOC

Select Organic COCOMO

- Effort = $2.4 (KLOC)^{1.05}$ PM
- Tdev = $2.5 (Effort)^{0.38}$ Months